CREB Binding Protein.

Merk et al. report that mutations in the acetyltransferase CREBBP have opposing effects during the development of the cerebellum, the primary site of origin of Sonic hedgehog Medulloblastoma.

Data reveal that loss of Crebbp in cerebellar granule neuron progenitors (GNPs) during embryonic development of mice compromises GNP development, in part by downregulation of brain derived neurotrophic factor (Bdnf). Interestingly, concomitant cerebellar hypoplasia was also observed in patients with Rubinstein-Taybi syndrome, a congenital disorder caused by germline mutations of CREBBP. By contrast, loss of Crebbp in GNPs during postnatal development synergizes with oncogenic activation of SHH signaling to drive MB growth, thereby explaining the enrichment of somatic CREBBP mutations in SHH MB of adult patients. Together, our data provide insights into time-sensitive consequences of CREBBP mutations and corresponding associations with human diseases [1)].

1)
Merk DJ, Ohli J, Merk ND, Thatikonda V, Morrissy S, Schoof M, Schmid SN, Harrison L, Filser S, Ahlfeld J, Erkek S, Raithatha K, Andreska T, Weißhaar M, Launspach M, Neumann JE, Shakarami M, Plenker D, Marra MA, Li Y, Mungall AJ, Moore RA, Ma Y, Jones SJM, Lutz B, Ertl-Wagner B, Rossi A, Wagener R, Siebert R, Jung A, Eberhart CG, Lach B, Sendtner M, Pfister SM, Taylor MD, Chavez L, Kool M, Schüller U. Opposing Effects of CREBBP Mutations Govern the Phenotype of Rubinstein-Taybi Syndrome and Adult SHH Medulloblastoma. Dev Cell. 2018 Mar 9. pii: S1534-5807(18)30107-2. doi: 10.1016/j.devcel.2018.02.012. [Epub ahead of print] PubMed PMID: 29551561.